

CONNECTORS

Dr. Ahmad El-Kouedi

Lecturer of Fixed Prosthodontics

Definition: part of bridge that connects between the pontic and retainer, making the bridge one component.

- ❑ Types:
 - ❑ 1- Non-rigid connectors (stress breakers)
 - ❑ Used in: difficult path of insertion
 - ❑ Grade I mobility
 - ❑ Where inlay is indicated on abt
 - ❑ Segmentation of large complex br
-

☐ A) precision attachment

☐ B) Non-Precision

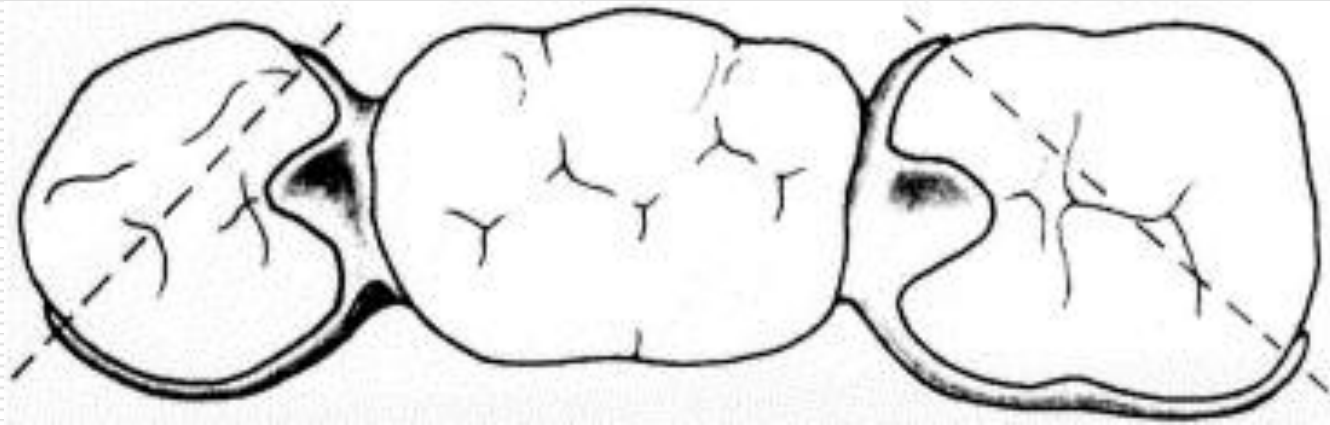
☐ - occlusal rest

- sub-occlusal rest

- lingual rest

- NB: all rest must be placed over an inlay to prevent cavitation.

Occlusal Rests



Lingual rests



❑ 2 Rigid Connectors

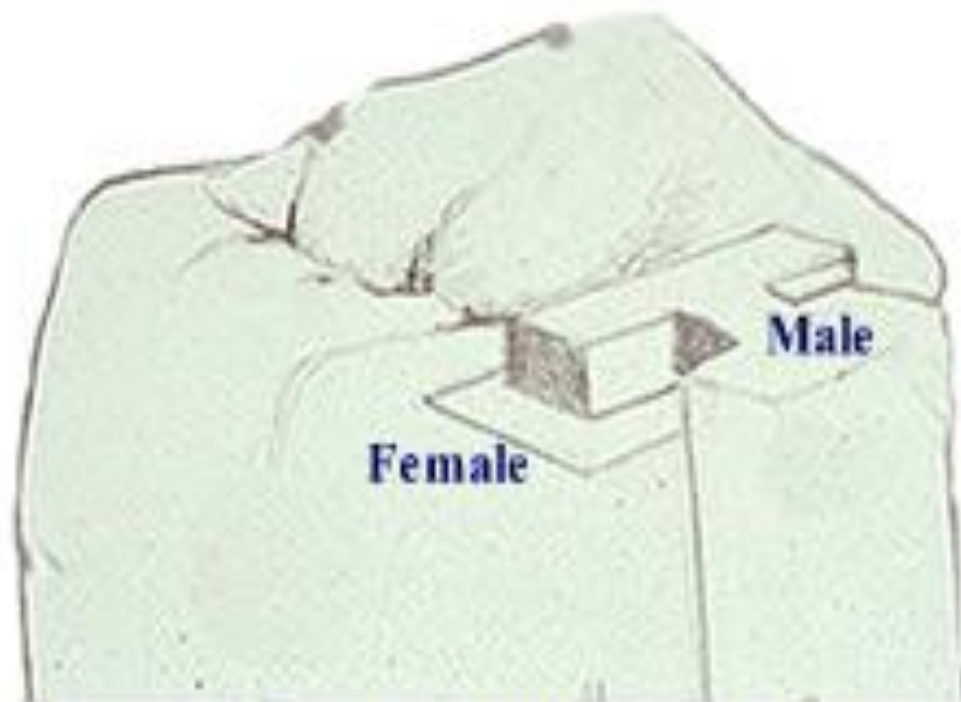
❑ A) Casting : casted with the wax ~~pattern as one piece.~~ Better, quicker, less variable of faults.

❑ B) Soldering : union of two similar or dissimilar metals or alloys by melting and flowing an intermediate metal or alloy. Solder alloy = solder joint.

❑ C) Welding: union of two metals/alloys together with no solder alloy.

Precision Attachment

- ❑ Other names: male/female attachment; key/keyway att; patrix/matrix att; frictional or slotted.
 - ❑ Used in Removable Bridge; Partial Denture; over denture
 - ❑ Composed of two parts
-



**The Female is attached to crowns or bridgework.
The male is attached to the partial denture**

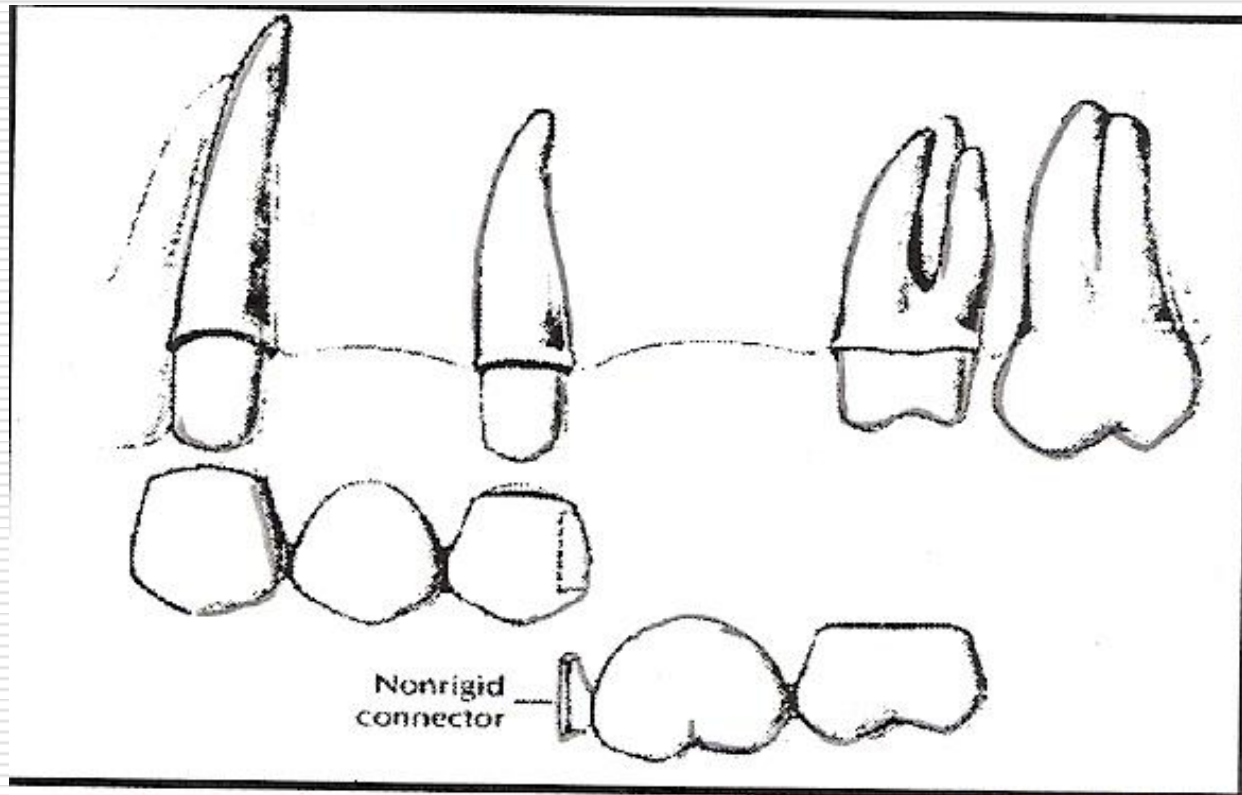
Precision attachment



Indications

- ☐ Esthetics: severe vertical or labial bone loss
 - ☐ Edentulous space problems (tilted molars or no path of insertion)
 - ☐ Available abutments will not allow a fixed restoration
 - ☐ Presence of pair abutments
 - ☐ Conjunction with implants???
-

Peir Abutments



Contraindications

- ☐ Poor abutments:
 - ☐ Short teeth
 - ☐ Narrow teeth
 - ☐ large pulp horns (young age)
 - ☐ low bone support.
-

Advantages over RPD

- ☐ No clasps= better esthetics
 - ☐ Good retention
 - ☐ Reduced bulk of restoration
 - ☐ Eliminates food stagnation (removed and cleaned)
 - ☐ Minimizes lateral stress on abutments and allows the ridge to absorb some of the occlusal stresses
-

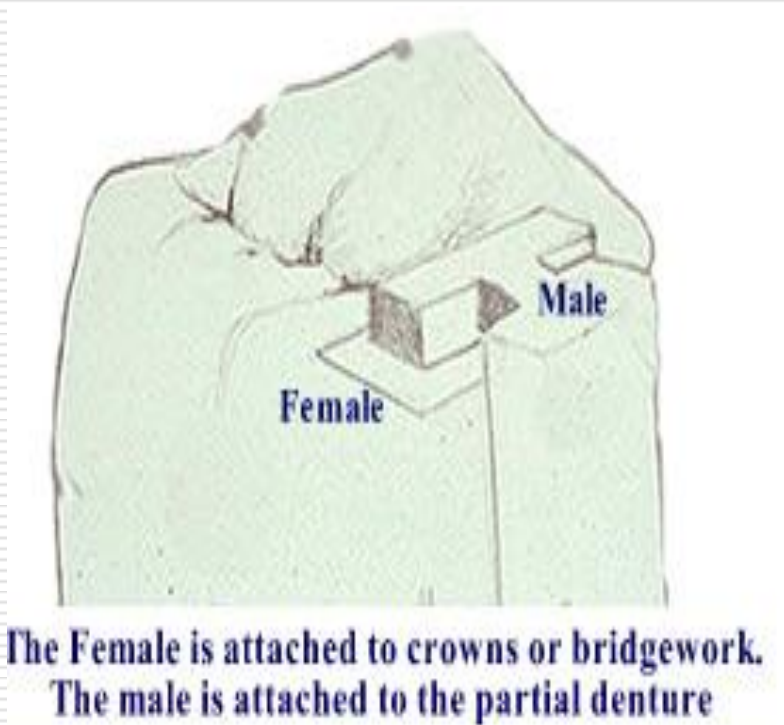
Disadvantages

- ☐ Limited to teeth of adequate size
 - ☐ Requires more reduction
 - ☐ High cost
 - ☐ Difficult laboratory steps
-

Types of Percision Attacments

- ❑ Intra-coronal: slot (female) put in retainer, flange (male) put in pontic/prosthesis. Directs forces along the long axis of the tooth, which is advantagous.
 - ❑ Extra-coronal: outside the abutment and usually allows some movements (stress breaker).
-

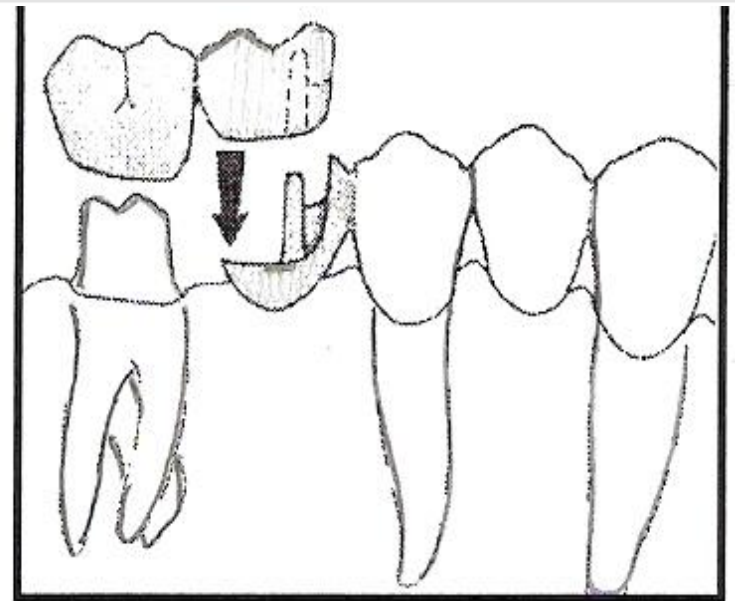
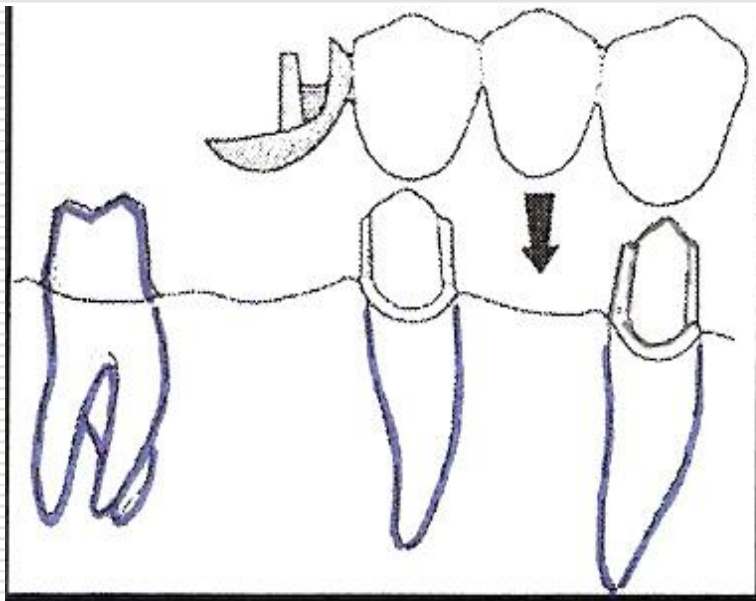
Intra and Extra coronal att



- ❑ Stud attachments : used with RCT roots to retain an over denture or RPD.
 - ❑ Bar attachments: consists of bar spanning the edentulous area connecting teeth/roots. Sleeve (rider) incorporated into the fitting surface of denture.
 - ❑ Split Pontic Att: pontic consists of two parts, used when there is no common path of insertion.
-

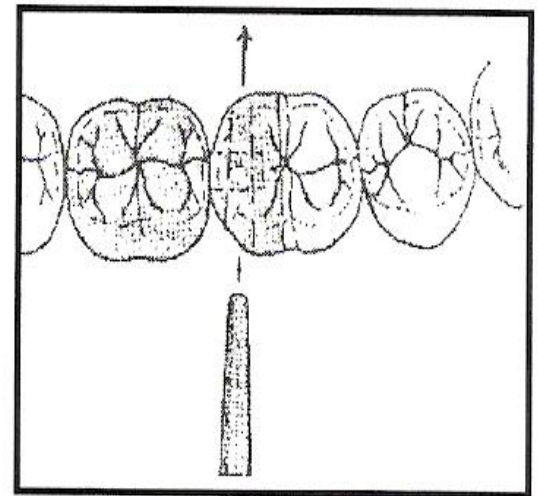
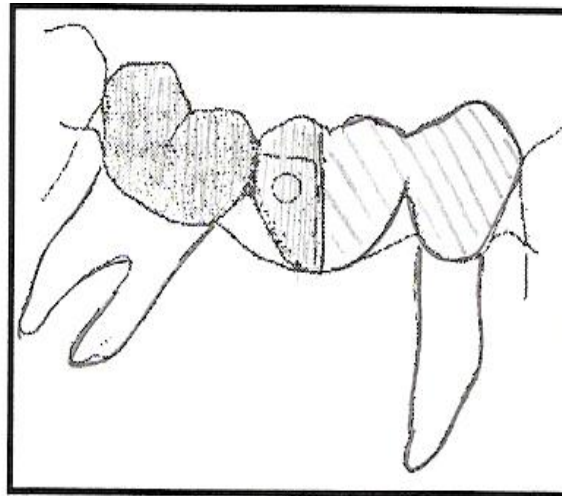
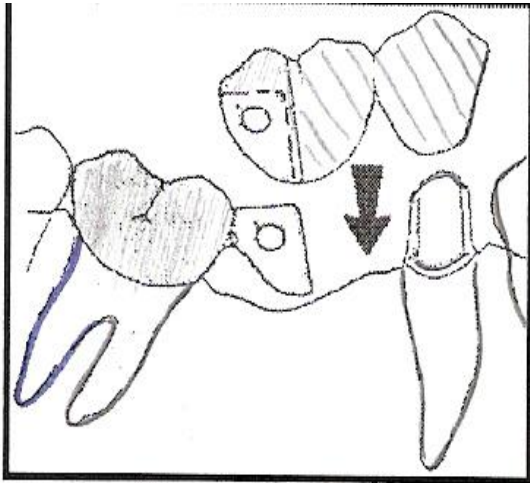


Split Pontic Attachment



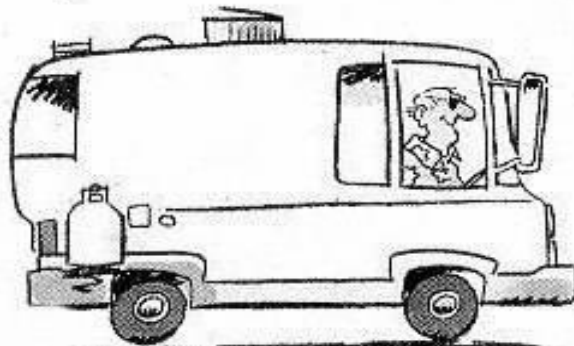
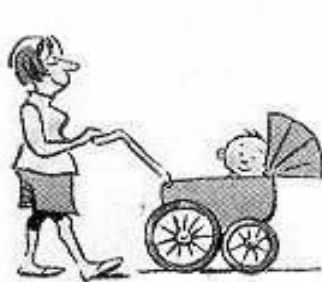
- ❑ Cross Pin & Wing Att: retainer with wing and hole; pontic with hole.
 - ❑ Auxillary Att: other types such as screw elements or swing lock attachments.
-

Cross Pin and Wing Attachment





The Wheels of Life



Soldering

- ☐ Requirements of solder alloy:
 - ☐ Melting temp below that of parents
 - ☐ Same carat/colour
 - ☐ Highly flowable
 - ☐ High strength
 - ☐ T & C resistant
-

- ❑ Composition: similar to parent alloy but with Zn & Sn added to reduce the melting temp
 - ❑ Soldering flux: applied to surface to be soldered, helps to prevent oxidation & increases the flow of the solder
 - ❑ Types: fluoride (base metal)
borax (gold)
 - ❑ Soldering antflux: used to outline the area to be soldered and limit the solder spread (pencil, iron rouge)
-

- ❑ Soldering Investment: can use gypsum or ph bonded.
 - ❑ Must have low thermal and setting expansion, withstand the heat.
 - ❑ Mode of heat application:
 - Torch, gas or oxyacetylene, reducing zone of flame
 - Oven soldering
 - Infrared soldering
-

Principles of Soldering

- ❑ Use solder alloy similar to parent in terms of composition, carat and colour.
 - ❑ Wall to soldered should not be less than 0.5mm otherwise deformation will occur.
 - ❑ Surface must have adequate metal surface
 - ❑ Gap distance 0.2-0.7mm (business card thickness)
 - ❑ All free margins not to be soldered should be covered by the investment.
-

Soldering of Metalceramic units

☐ **Pre-ceramic**

- ☐ Before porcelain
- ☐ Solder below melting temp of parent alloy but above firing temp of porcelain.

☐ **Post-ceramic**

- ☐ After porcl applictn
 - ☐ Solder below parents and firing of porcelain.
-

Indications

☐ **Pre**

- ☐ Defect in one retainer only
- ☐ When bridge is too big for accurate one piece casting

☐ **Post**

- ☐ Failure to seat unglazed bridge at tryins or final
 - ☐ Attaching gold units to metal ceramic units
-

Advantages

☐ **Pre**

- ☐ Adjustments can be done before porcelain appl

☐ **Post**

- ☐ No sagging of metal as porcelain is fired over shorter segments
-

Techniques

☐ **Pre**

- ☐ Phosphate bonded invest
- ☐ Oxyacetylene torch
- ☐ Rapid cooling (quenching) to improve metal properties

☐ **Post**

- ☐ Gypsum bonded
 - ☐ Gas-air torch
 - ☐ No quenching as this will cause porcelain to fracture
-

Problems

- ❑ Pre
 - ❑ Lack of oxides at connector area for porcelain bonding
 - ❑ Proper proximal contouring and embrasures is difficult
 - ❑ Liability to sag on firing
 - ❑ Post
 - ❑ Incomplete solder joint due to limited access
 - ❑ Porcl discolouration from flux
 - ❑ Porcl roughening/loss of glaze due investment
 - ❑ Cracking of porcelain on heating
-

Laser Welding

- ❑ Welding precision att
 - ❑ Bridge units
 - ❑ Building up proximal or occ contacts
 - ❑ Advantages: heat zone smaller; less distortion; can be done near veneering materials (plastic); reduces overall lab steps
 - ❑ Disadvantages: high cost, qualified technician, hazardous to user
-